

Appln. No. 10/609,179
Response dated August 23, 2006
Reply to Office Action of February 24, 2006

REMARKS/ARGUMENTS

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Amendment to the Claims

Claim 1 is amended to include the prior limitation of claim 4 and claim 4 is cancelled.

Claims 8, 9 and 10 are amended to correct the error in the grammatical usage of coagulant time rather than coagulation time.

Pending Claim

Claims 1-3, and 5-27 remain pending in the present application.

Claims 28-43 are withdrawn.

I. Restriction Requirement

The claims of the present invention are subject to a restriction requirement: Claims 1-27 drawn to a method for making synthetic leather; and Group II, Claims 28-43 drawn to a synthetic leather.

A provisional election was done with traverse to the election of Group 1, Claims 1-27. Applicants affirm this election without traverse.

II. Claim Objections.

Claims 8-10 were objected to because of the informality of the use of the term "coagulant time". The claims are amended to "coagulation time", consistent with Claim 1.

III. Rejection under 35 USC §102.

Claim 1 and 12-14 stand rejected under 35 USC §102 in view of Hoersch (US 2004/0257730 A1). Hoersch is cited as impregnating a textile substrate with a polyurethane dispersion comprised of a nonionizable polyurethane and an external stabilizing surfactant; followed by exposing to water containing a coagulant for a time sufficient to coagulate the dispersion.

The present claimed invention differs substantially from Hoersch. Initially Hoersch does not disclose the "impregnation" of a woven textile with a polyurethane dispersion. The process in Hoersch requires "foaming" an aqueous

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polyurethane dispersion, applying this foam to the fabric and then collapsing the foam.
See paragraphs [0050] and [0051].

The present claimed invention further differs from the teaching of Hoersch by the type of coagulant agent used. The coagulant of Hoersch is an acid of a salt, see paragraph [0029]; whereas, the dispersion of the present invention is coagulable by a multivalent cation neutral salt.

Claims 1 and 12-14 are clearly distinguished from the teachings of Hoersch based on the above-noted differences.

IV. Rejection under 35 USC 103 (a)

A. Claim 11. Claim 11 stands rejected under 35 USC 103(a) as being unpatentable over Hoersch (US 2004/0257730 A1) in view of Shikada (US 3,772,059). Shikada is cited as disclosing a process of leaching with water to remove an inorganic salt. The teachings of Hoersch, as disclosed in III are above, are combined with the teachings of Shikada to give the process of Claim 11. The motivation to combine the references is given as both processes are to the formation of a synthetic leather, and Shikada further discloses the removal of the salt from the materials. The rejection is respectively traversed.

Claim 1, from which claim 11 depends is clearly distinguished from the teaching of Hoersch as given in III above. The teachings of Shikada do not make up the deficiencies of the teaching of Hoersch. Claim 11 is thus clearly inventive over Hoersch in view of Shikada.

B. Claims 1-3, 5 and 8-10. Claims 1-3, 5 and 8-10 stand rejected under 36 USC 103(a) as being unpatentable over Spek (US 4,833,173) in view of Kukkala et al. (US 5,859,111). Spek is cited as disclosing coagulating materials such as textile cloth by impregnating it into an impregnating bath containing a coagulable polymer latex and a heat-coagulant and a chemical or physical foaming agent, followed by coagulation. The Office Action notes Spek does not teach the use of a nonionizable polyurethane.

Kukkala et al. is cited as disclosing a process for preparing an aqueous polymeric dispersion which comprises the steps of using a nonionizable polyurethane

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dispersed in water with a dispersing aid such as a surfactant. The Office Action also cites column 1, lines 23-59 of Kakkala as disclosing nonionizable polyurethane dispersions which do not require an organic solvent, and further the dispersion can be used to make synthetic leathers (column 11, lines 3-33).

The Office Action states it would have been obvious to modify the process taught by Spek to include the polymeric dispersion taught by Kukkala et al. The motivation is given as it is alleged Kukkala et al. teaches a polyurethane dispersion that can be used with textile substrates and for forming synthetic leathers that have pH stability, and good water and solvent resistance and does not require the use of an organic solvent.

This rejection is respectfully traversed.

First, it must be noted that Kukkala et al. does not teach the use of aqueous polyurethane dispersion for the production of synthetic leather. Column 11, lines 3-8, is very clear the dispersions find use as or in sealants for applications to various substrates. A leather substrate is included as one substrate to which the dispersion can be applied as a sealant. There is no teaching in Kukkala et al. that the dispersions are suitable for producing a synthetic leather.

Secondly, an important feature of the present claimed invention is the dispersion undergoes coagulation in the presence of a multivalent cation neutral salt. From Applicants' review of Kukkala et al., there is no reference which suggests the formulations as taught in Kukkala et al. are capable of coagulation.

Kukkala et al's approach to the elimination of a solvent as disclosed in column 1, lines 45-48, is also different from the present claimed invention. To form the stable dispersion of Kukkala et al, an interpenetrated polymer of a hydrophobic polyurethane and a polymer prepared from one or more ethyleneically unsaturated monomers is prepared. By contrast, the dispersions of the present invention are stabilized by the presence of an external stabilizing surfactant.

Furthermore, the process of Spek requires for coagulation a polymer latex, which is heat coagulable; and requires foaming of the polyurethane dispersion. Applicants' reading of Spek could find no reference to the use of a multivalent cation

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neutral salt as the coagulant as in the present claimed invention. Additionally, the present process does not involve the foaming of the polyurethane dispersion.

Based on the numerous differences between Spek and Kukkala et al. as described above, there is no combination of the teaching of these two references which would result in the present claimed invention.

C. Claim 6. Claim 6 is rejected under 35 USC §103 (a) as being unpatentable over Spek in view of Kukkala et al as applied to claims 1, 4 and 5 above.

Based on the numerous difference between Spek and Kukkala et al. as described in IV (B) above and the dependence of Claim 6 from Claim 1, Applicants submit there is nothing in the combination of the two references which would give the present invention of Claim 6.

D. Claims 15 and 16. Claims 15 and 16 are rejected under 35 USC §103(a) as unpatentable over Spek in view of Kukkala et al. as applied to claim 1 in further view of Hoersch (US 2004/0253370).

Hoersch is cited as describing the use of a frothed aqueous polyurethane dispersion on a textile substrate in order to obtain a synthetic suede leather. The Office Action states it would have been obvious to modify the process taught by Spek in view of Kukkala et al. to include the step of applying a frothed aqueous polyurethane dispersion to the impregnated textile. The motivation cited in the Office Action is both references teach impregnating textiles to resemble leather, and Hoersch further teaches that using the frothed aqueous polyurethane dispersion results in a synthetic leather which has pleasant appearance, good feel and excellent color stability. Therefore, one would have a reasonable expectation of success in forming the synthetic leather with the benefits described by Hoersch.

This rejection is respectfully traversed. The difference between the present claimed invention and Spek and Kukkala et al. are given in IV (B). A combination of the three references would not give the present claimed process explained above.

E. Claim 17. Claim 17 is rejected under 35 USC §103(a) as unpatentable over Spek in view of Kukkala et al and Hoersch as applied to Claims 15 and 16, and

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further in view of Shkapenko et al. (US 3,598,780). The rejection is respectfully traversed.

Shkapenko et al. is cited as disclosing forming a foamed polyurethane that is applied to a substrate and then washed with clear water, dried, and after the drying the coating is leached with warm water to produce micropores within the film.

The differences between the present claimed invention versus the prior are given in IV (B) above. As Claim 17 includes all the limitations from Claim 1, there is nothing in the teaching of Shkapenko et al., which when added to the teachings of the other cited references, would give the subject matter of Claim 17.

F. Claims 18-21 and 27. Claims 18-21 and 27 stand rejected under 35 USC 103(a) as being unpatentable over Spek in view of Hoersch.

Spek is cited as disclosing a method of impregnating a textile substrate with a polymer in order to form a synthetic leather. Hoersch is cited as disclosing the use of a foamed aqueous polyurethane dispersion to supply a synthetic leather that has a pleasant appearance and good feels as well as excellent color stability. The foamed aqueous polyurethane dispersion is applied to a textile and is dried and cured. This rejection is respectfully traversed.

The coatings proposed by Hoersch are prepared from polyurethane dispersions which are foamed, not frothed. It is then necessary for the foam to collapse followed by steam coagulation of the collapsed foam. See paragraph [0051]. By contrast, the present claimed invention contains a stabilizer to stabilize the froth, see page 20, lines 11-20, of the specification. The froth applied in the present invention is then dried. The process of the present invention is clearly distinct from what is taught in Hoersch.

Combining the teaching of Spek with Hoersch does not make up for the deficiencies of Hoersch to make the present claimed invention obvious.

G. Claims 22-24. Claims 22-24 stand rejected under 35 USC §103(a) as unpatentable over Spek in view of Kukkala et al as applied to claim 18 in further view of Goldner et al. (US 3,169,885) and Iwato et al. (US 6,649,276 B2). This rejection is respectfully traversed.

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Golodner et al is cited as disclosing a process of leaching a synthetic leather made from polyesterurethane. Iwato et al. is cited as disclosing coating a substrate with an aqueous emulsion.

Claim 22-24 are dependent from or ultimately depend from Claim 18, and the distinguishing features of Claim 18 over Spek in view of Hoersch are given in IV(F). The claims of 22-24 are inventive over the additional references as neither Golodner nor Iwato et al. make up for the deficiencies of Spek and Hoersch to give the invention of Claim 18.

H. Claims 25 and 26. Claims 25 and 26 stand rejected under 35 USC §103(a) as unpatentable over Spek in view of Kukkala et al as applied to claim 8 above and further in view of Gribble et al (US 2004/019992 A1). This rejection is respectfully traversed.

Claim 25 and 26 are dependent from or ultimately depend from Claim 18, and the distinguishing features of Claim 18 over Spek in view of Hoersch are given in IV(F). Claims of 22-24 are inventive over the additional references as Gribble et al. does not make up for the deficiencies of Spek and Hoersch to give the invention of Claim 18.

V. SUMMARY

It is believed this response is fully responsive to the Office Action mailed February 24, 2006. Reconsideration and allowance of claims 1-3 and 5-27 is respectfully requested. If there are any remaining issues, it is requested the Examiner contact the representative for the Applicants at the telephone number below.

Respectfully submitted,



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